equation of each. The artificial star, which was made to transit alternately from right and left, was contrived by bringing a minute pencil of light to a focus in the place of the wires of one of the collimating telescopes of the transit instrument.

Mr. Ellery stated that the apparatus had not been brought thoroughly into use yet, but from a few trials he hoped it would be found to be a very easy and accurate method of making this somewhat troublesome determination. He promised at some future time to communicate the result of his experience with this apparatus.

ART. XXIV.—*Description of a Pendulum Apparatus for Determining the Length of a Seconds' Pendulum in Melbourne.* By Professor NEUMAYER.

[Abstract of paper read 31st August, 1863.]

This paper was illustrated by some large drawings which thoroughly explained the peculiarity of the pendulum used by Professor Neumayer, as compared with Bessel's, Captain Katers, &c.

The pendulum itself was constructed by Mr. Lohmeir, of Hamburg, under the supervision of Professor Peters, of the Altona Observatory. It was reversible by two knife edges, and was adjusted with such nicety that there remained a difference of only 0·00024 of a second between the duration of an oscillation in both positions of the pendulum. The measuring apparatus consisted of a frame with two micrometer miscroscopes, in which either the pendulum or a scale (a copy of Bessel's Prussian Standard) could be suspended, and the knife edges in one case or the divisions of the scale in the other brought under the micrometers. This apparatus was constructed, under Professor Neumayer's own supervision, by Mr. H. Schreiber, of Melbourne. The micrometer was capable of measuring to 0·0017 of an English inch. The whole apparatus was conveniently fitted up in a cellar under Professor Neumayer's house. The clock used was one by Shepherd, of London, and was comparable by means of a telegraphic needle connected by a wire with the standard clock of the Melbourne Observatory, about 500 yards distant. Comparisons were generally made three times a day. The coincidences were

obtained by a projection from the pendulum of the clock eclipsing a white line on the lower extremity of the large pendulum at the moment the two pendulums passed the vertical together. This coincidence was observed by means of a telescope. The distance of the clock from the pendulum was about eight feet, and the points of the pendulums were rendered visible together in the focus of the telescope by means of an intervening lens. A standard barometer and thermometer were suspended close to the pendulum and were constantly referred to during every series of observations.

The scale of comparison was finally compared with the ten feet standard bar of the Colony in the Crown Lands Department by the Government Astronomer. In conclusion, Professor Neumayer stated that his speedy departure for Europe would render it impossible to make public the final results until after his arrival there.

ART. XXV.—*Further Notes on the Coast and Lakes of Gipps Land, with sketch plan, being supplementary to report on the Lakes Entrance.*

By THOMAS E. RAWLINSON, ESQ., C.E.

[Read 29th June, 1863.]

1. Having late in the month of July last, received instructions to proceed to the entrance of the Gipps Land Lakes, to make a survey of the same for public purposes, I have been enabled to obtain certain data, which I now purpose laying before the members of the Society.

2. In my report of February last, on the lake entrance, which I was permitted to bring before the Society, I gave a general description of the physical features of the coast line, and of the chief lakes and rivers debouching into them, with such remarks and inferential reasoning on the same as my then means permitted.

3. Since the date of writing the report above alluded to, great changes have taken place at the entrance, owing chiefly to the great and continuous drought of last summer having reduced the outflow of waters from the lakes, which, combined with the action of the tides and of certain winds on the sands of the coast, so far blocked up the old entrance that it could be crossed on foot. These droughts were followed by unusual floods, the waters of which obtained